

3266403v1  
22602/095373

UNIT PRICE CATALOG		Location Factor: 0.94		MASTER [BASELINE] RCM	
© 2002 Project Planning & Management, Inc.		Sales Tax: 6.0%		Berrien City, MI	
		Ave Sub Gen'l Conditions: 2%		Cost Adjustments	
System	Description	Base Unit Cost	Adjusted Unit Cost	Unit	Loc_Fctr S_Tax Sub_GC
col_sprd_ftg	3000 PSI concrete				
1.	forms, rebar, concr, placing, finish	\$204.00	\$201.35	CY	0.94 3% 2%
sprd_ftg	3000 PSI concrete				
1	Not Req'd (Trench Footing)	\$0.00	\$0.00	LF	
2	12" thick x 18" wide; forms, reinf, direct chute	\$12.06	\$11.90	LF	0.94 3% 2%
3	12" thick x 24" wide; forms, reinf, direct chute	\$13.71	\$13.53	LF	0.94 3% 2%
4	(For Precast Foundations) 12" thick x 24" wide; 3/4" stone bedding	\$2.22	\$2.19	LF	0.94 3% 2%
fdn_drain					
1	PVC 4" dia; gravel drain bed	\$4.00	\$3.95	LF	0.94 3% 2%
2	PVC 6" dia; gravel drain bed	\$5.00	\$4.94	LF	0.94 3% 2%
fdn_wall	4' high foundation wall				
		(deduct of 4*\$0.70 eliminates 1" rigid insul)			
1	Poured-8"; bitum/damp; sill plates	\$20.44	\$20.17	LF	0.94 3% 2%
2	Poured-10"; bitum/damp; sill plates	\$23.60	\$23.29	LF	0.94 3% 2%
3	Poured-10"; brickledge; bitum/damp; sill plates	\$31.16	\$30.75	LF	0.94 3% 2%
4	Poured-12"; bitum/damp; sill plates	\$26.08	\$25.74	LF	0.94 3% 2%
5	Poured-12"; brickledge; bitum/damp; sill plates	\$33.64	\$33.20	LF	0.94 3% 2%
6	Block-8", grouted; bitum/damp; parging; sill plates	\$37.84	\$37.35	LF	0.94 3% 2%
7	Block-10", grouted; bitum/damp; parging; sill plates	\$42.44	\$41.89	LF	0.94 3% 2%
8	Block-12", grouted; brickledge; parging; bitum/damp; sill plates	\$47.28	\$46.67	LF	0.94 3% 2%
9	Pre-Cast Wall System, bitum/damp; sill plates	\$22.80	\$22.50	LF	0.94 3% 2%
10	ICF (Insulated Concrete Foundation); sill plates	\$32.70	\$32.28	LF	0.94 3% 2%
11	Trench footing/grade beam; 12" poured/reinf; earth formed; no insul	\$21.76	\$21.48	LF	0.94 3% 2%
12	Wood 2x8; 16"OC; CDX sheathing; vapor, 9" insul R-30	\$24.04	\$23.73	LF	0.94 3% 2%

Figure 2





SECTION 7: BUILDING SYSTEMS			
	<p><i>This final section will explore and document your quality expectations for various building systems in your new home. These decisions are important as they will directly affect the construction budget. In addition, building envelope selections (walls, roof, windows, insulation) will also impact energy heat loss calculations.</i></p>		
<b>01 Foundation</b>			
<b>011 Standard Foundations</b> <input type="checkbox"/> Sand/Gravel Soil <input type="checkbox"/> Sand/Clay Soil <input type="checkbox"/> Problem Soils (e.g., water; low soil bearing capacity)			
<b>02 Substructure</b>			
<b>021 Slab on Grade</b> <input type="checkbox"/> 4" thick (standard) <input type="checkbox"/> 5" thick <input type="checkbox"/> 6" thick			
<b>022 Excavation: Basement</b> <input type="checkbox"/> No Basement <input type="checkbox"/> Crawlspace <input type="checkbox"/> Full Basement <input type="checkbox"/> Partial Bsmt (some of Ground Floor living area on slab)			
<b>023 Basement Walls</b> <b>Wall Material</b> <input type="checkbox"/> Poured concrete <input type="checkbox"/> Concrete block/parging <input type="checkbox"/> Wood foundation <input type="checkbox"/> "Superior" Precast Foundation Wall System w/1" insulation			
<b>Waterproofing</b> <input type="checkbox"/> Standard Protection <input type="checkbox"/> Premium Protection			
<b>Insulation</b> <input type="checkbox"/> None <input type="checkbox"/> 1" Rigid (R-5) <input type="checkbox"/> 2" Rigid (R-10) <input type="checkbox"/> 3" Rigid (R-15)* (recommended) <span style="display: block; text-align: right;">*Energy Star</span>			
<b>03 Superstructure</b>			
<b>031 Floor Construction</b> <b>NOTE:</b> Priced from least to most expensive per SF of floor system (left to right)			
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <input checked="" type="checkbox"/> <b>1</b> Composition "I" Joists (Standard spans to 24') <small>* 1" x 3" Ceiling furring not required</small> </div> <div style="width: 30%;"> <input type="checkbox"/> <b>2</b> Dimension lumber (e.g. 2x12) (Standard spans to 19') <small>* Material readily available</small> </div> <div style="width: 30%;"> <input type="checkbox"/> <b>3</b> Truss Joists (Standard spans to 24') <small>* Utilities easily pass through</small> </div> </div>			
<div style="display: flex; justify-content: space-around; text-align: center;">    </div>			
<b>032 Roof Construction</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <b>House</b> <input type="checkbox"/> SIP / Timber Frame  <b>Garage</b> <input type="checkbox"/> SIP / Glu Lam Ridge Beam  <b>Dormers</b> <input type="checkbox"/> SIP             </div> <div style="width: 30%;"> <input type="checkbox"/> Prefab trusses      <input type="checkbox"/> Dimensional lumber (e.g. 2x10)  <input type="checkbox"/> Prefab trusses      <input type="checkbox"/> Dimensional lumber (e.g. 2x10)  <input type="checkbox"/> Dimensional lumber (e.g. 2x8)             </div> <div style="width: 30%;"> <b>SIP Thickness</b> <input type="checkbox"/> SIP Not Used      <input type="checkbox"/> 8.25" OSB/OSB (R-34)      <input type="checkbox"/> 10.25" OSB/OSB (R-42)  <input type="checkbox"/> 4.5" OSB/OSB (R-18)      <input type="checkbox"/> 6.5" OSB/OSB (R-27)      <input type="checkbox"/> 12.25" OSB/OSB (R-45)             </div> </div>			
<b>SIP Interior Finish</b> <input type="checkbox"/> 1/2" Gypsum Board <input type="checkbox"/> Tongue & Groove "T&G" (pine or cedar)			
<b>033 Stair Construction</b> <b>Basement Stair</b> <input type="checkbox"/> Basement stairs, open riser <input type="checkbox"/> Pine treads/risers, box stairs, WALLS 2 SIDES/handrail only <input type="checkbox"/> Pine treads/risers, box stairs, balusters/handrail, newel post			
<b>Ground Floor Stair</b> <input type="checkbox"/> Pine treads / risers (pine), box stairs, balusters/handrail, newel post <input type="checkbox"/> Hardwood treads / risers, box stairs, WALLS 2 SIDES, balusters/handrail, newel post <input type="checkbox"/> Hardwood treads / risers, box stairs, balusters/handrail, newel post <input type="checkbox"/> Curved stairway (hardwood), open 1 side <input type="checkbox"/> Curved stairway (hardwood), open 2 sides			
<b>Auxiliary Stair</b> <input type="checkbox"/> None <input type="checkbox"/> Attic stair; folding; pine; 8'-6" <input type="checkbox"/> Pine treads / risers (pine), box stairs, handrail, newel post <input type="checkbox"/> Spiral stairs, oak <input type="checkbox"/> Hardwood treads / risers, box stairs, handrail, newel post <input type="checkbox"/> Spiral stairs, metal			

Figure 3

ZIP CODE	CITY	STATE	Regional Adjustment Factor	Winter Design Temp		Deg Days Heating DD	Deg Days Cooling DD	Sales Tax Tax Rate	Sub GC %	Escalation %
				99%	97.5%					
35000	Cullman	AL	0.85	17	21	2,823	1,881	4%	2%	1.50%
35200	Birmingham	AL	0.86	17	21	2,823	1,881	4%		

Figure 4

**ENERGY MODEL**

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**MASTER [BASELINE] RCM**  
Benton City, MI  
4 Bedroom, 5 Bath

**TOTAL FINISHED AREA (TFA): 4,778 SF**  
**TOTAL CONSTRUCTED AREA: 0,358 SF**

Enter:	State	Residential Energy Code	State Mandate	Comments
MI	Michigan	Michigan Uniform Energy Code Part 10 Rules, less stringent than 1992 MEC	Yes	Prior to June 22, 1997, the state of Michigan had no building energy efficiency requirements. On July 27, 1996, the state adopted ANSI/ASHRAE/IES Standard 90A-1980 statewide. SB 719, signed in early January 1996, repealed the 1995 adoption of the 1993 MEC. The legislation directed the state construction code commission to, by April 1, 1997, provide cost-effective standards and establish a program to provide home buyers with energy rating information. The Michigan Uniform Energy Code Part 10 Rules were adopted March 31, 1999.

Envelope Heat Loss	Area (SF)	R-Value	U Factor	Delta T	Heat Loss (BTUH)
Heat Loss-Basement Walls	1,821	6	0.16	22	6,359
Heat Loss-Basement Floor (or Ground Fir Slab)	3,193	25	0.04	22	2,814
Heat Loss-Walkout Wall	1,500	14	0.07	69	7,555
Heat Loss-Walls	440	14	0.07	69	2,206
Heat Loss-Windows (low-E) Default (R-3)	585	3	0.33	69	13,455
Heat Loss-Windows Standard Glazing (R-2)	0	2	0.50	69	-
Heat Loss-Windows (low-E) Triple Glaze (R-5)	0	6	0.17	69	-
Heat Loss-Doorwalls	126	3	0.33	69	2,898
Heat Loss-Doorwalls	0	3	0.33	69	-
Heat Loss-Doors	84	5	0.20	69	1,169
Heat Loss-Roof SIP (on Timber)	1,203	36	0.03	69	2,439
Heat Loss-Roof SIP (on SIP)	0	0	0.00	69	-
Heat Loss-Atric (Uninsulated Roof Rafter)	547	16	0.06	69	2,383
Heat Loss-Skylights	0	3	0.33	69	-
<b>Building Envelope Heat Loss</b>					<b>41,268 BTUH</b>

Envelope Tightness	Select >	Energy Star	Very Tight	ACH (Air Changes / Hour)	Design Occupancy
	4	Energy Star	Very Tight	0.25	5

Infiltration / Ventilation	CFM	ACH	Constant	Volume	Delta T	Heat Loss (BTUH)
Natural Infiltration	303	0.25	1.08	72,764	69	22,583
Mechanical Ventilation w/AUX	424	0.35	1.08	72,764	18	8,251
<b>75% AALX Efficiency</b>	<b>141.09</b>	<b>1.0n Target CFM</b>				

Envelope + Infiltration Heat Loss =	Furnace AFUE =	90%	2	<Select Furnace Eff.	Natural Gas	10 therms (10mcf) = 1,000,000 BTU's
Furnace Size =	80,126 BTUH				Electricity	293 KWH = 1,000,000 BTU's
D = Degree Days =	5,439				Propane	10.9 Gallons = 1,000,000 BTU's
T = Temp diff =	69 degrees				Heating Oil	7.21 Gallons = 1,000,000 BTU's
V = Fuel value =	1,052 BTUH per					
V = Fuel value =	91,743 BTUH per					
V = Fuel value =	3,413 BTUH per					
CF1 =	1.36					
CF2 =	0.71					

(per National Climatic Data Center)

**E = Annual Energy Consumption =**

164,715	cu ft natural gas	\$0.58	cost per therm NGAS
1,809	gallons of propane	\$0.0058	cost per CF of nat gas
	KWH of electricity (100% Efficiency)	\$0.35	cost per gallon Propane
		\$0.075	cost per KWH of Electricity (Assumes Average Off Peak and Peak)

Annual Heating Cost =	\$955.35	NGAS
Annual Heating Cost =	\$1,794.32	PROPANE
Annual Heating Cost =	\$0.00	ELECTRIC

Figure 5

HOME SPECIFIC QUALITY / COST SELECTIONS				TOTAL FINISHED AREA: 4,778 SF		MASTER [BASELINE] RCM		P121			
237 System Selections				TOTAL CONSTRUCTED AREA: 8,358 SF		Brenton City, MI					
Q 2002 Project Planning & Management, Inc.						4 Bedroom, 5 Bath					
SUBSYSTEM				quan	unit	unit \$	total \$	BASELINE TOTAL	Savings		
01 Standard Foundations											
011.10	Spread footings (timber columns)	1	12" thick 30"x30"; forms, rebar, concrete	9	NCOLS	\$45.61	\$419	\$419	\$0		
011.10	Spread footings (ally columns)	1	12" thick 30"x30"; forms, rebar, concrete	5	EA	\$45.61	\$223	\$223	\$0		
011.20	Spread footings (foundation walls)	4	12" thick x 24" wide; forms, reinf, direct chute	43	LF	\$13.53	\$582	\$582	\$0		
011.20	Spread footings (basement walls)	5	12" thick x 24" wide; forms, reinf, direct chute, PVC 6" gravel drained	352	LF	\$18.47	\$6,506	\$6,506	\$0		
011.30	Foundation Wall (4' high)	1	Poured-8"; bitum/damp; sill plates	230	LF	\$33.17	\$7,640	\$7,640	\$0		
011.40	Excavation Foundation Wall Footing	2	4' depth spread ftg excav, sand/gravel, backfill, no compctn; rough grade	345	SF	\$0.39	\$136	\$136	\$0		
012 Special Foundations		1	No additional special foundations	345	SF	\$0.00	\$0	\$0	\$0		
02 Slab on Grade											
021.00	Ground Floor Slab on Grade	3	Not Used	0	SF	\$0.00	\$0	\$0	\$0		
021.00	Garage Floor Slab on Grade	1	4" slab w/4" gravel base, 6 mil vap, expan matl, W1.4/W1.4; steel trowel fnis	864	SF	\$2.69	\$2,328	\$2,328	\$0		
021.00	Basement Slab on Grade	3	4" slab w/4" gravel base, 6 mil vap, expan matl, W1.4/W1.4; steel trowel fnis	3,198	SF	\$2.69	\$8,617	\$8,617	\$0		
021.10	Basement Slab Insulation	1	Not Used	0	SF	\$0.00	\$0	\$0	\$0		
022 Excavation Basement		3	Walkout: Sand & gravel excav, backfill, compaction 8" lifts; rough grade	1,066	CY	\$7.72	\$8,125	\$8,125	\$0		
022.00	Off Site Trucking	1	Assumes off-site hauling NOT required (Assumes on-site placement of spoils)	0	CY	\$0.00	\$0	\$0	\$0		
023 Basement Walls		1	Poured-8"; bitum/damp; sill plates	1,821	BWA	\$5.37	\$9,643	\$9,643	\$0		
023.00	Partial Height Basement Wall Framing	1	Not Used	0	BWA	\$0.00	\$0	\$0	\$0		
023.10	Basement Wall Insulation	1	None	1,821	BWA	\$0.00	\$0	\$0	\$0		

### Baseline Selections

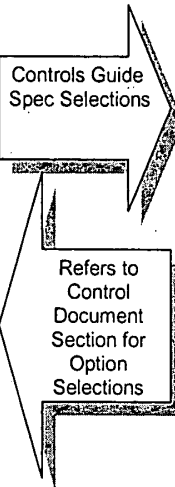
HOME SPECIFIC QUALITY / COST SELECTIONS				TOTAL FINISHED AREA: 4,778 SF		MASTER [BASELINE] RCM		P121		TOTAL		Savings
237 System Selections				TOTAL CONSTRUCTED AREA: 8,358 SF		Brenton City, MI				BASELINE		
Q 2002 Project Planning & Management, Inc.						4 Bedroom, 5 Bath						
SUBSYSTEM				quan	unit	unit \$	total \$					
011 Standard Foundations												
011.10	Spread footings (timber columns)	1	12" thick 30"x30"; forms, rebar, concrete	9	NCOLS	\$45.61	\$419	\$419	\$0	\$419	\$0	
011.10	Spread footings (ally columns)	1	12" thick 30"x30"; forms, rebar, concrete	5	EA	\$45.61	\$223	\$223	\$0	\$223	\$0	
011.20	Spread footings (foundation walls)	4	12" thick x 24" wide; forms, reinf, direct chute	43	LF	\$13.53	\$582	\$582	\$0	\$582	\$0	
011.20	Spread footings (basement walls)	5	12" thick x 24" wide; forms, reinf, direct chute, PVC 6" gravel drained	352	LF	\$18.47	\$6,506	\$6,506	\$0	\$6,506	\$0	
011.30	Foundation Wall (4' high)	1	Poured-8"; bitum/damp; sill plates	60	LF	\$33.17	\$1,990	\$1,990	\$0	\$1,990	\$0	
011.40	Excavation Foundation Wall Footing	2	4' depth spread ftg excav, sand/gravel, backfill, no compctn; rough grade	195	SF	\$0.39	\$77	\$77	\$0	\$77	\$0	
012 Special Foundations		1	No additional special foundations	195	SF	\$0.00	\$0	\$0	\$0	\$0	\$0	
021 Slab on Grade												
021.00	Ground Floor Slab on Grade	3	Not Used	0	SF	\$0.00	\$0	\$0	\$0	\$0	\$0	
021.00	Garage Floor Slab on Grade	1	4" slab w/4" gravel base, 6 mil vap, expan matl, W1.4/W1.4, steel trowel fnis	864	SF	\$2.69	\$2,328	\$2,328	\$0	\$2,328	\$0	
021.00	Basement Slab on Grade	3	4" slab w/4" gravel base, 6 mil vap, expan matl, W1.4/W1.4, steel trowel fnis	3,198	SF	\$2.69	\$8,617	\$8,617	\$0	\$8,617	\$0	
021.10	Basement Slab Insulation	1	Not Used	0	SF	\$0.00	\$0	\$0	\$0	\$0	\$0	
022 Excavation: Basement		3	RESELECT: Must Select 1" or 2" Full Basement Option	1,066	CY	RESELECT	RESELECT	RESELECT	RESELECT	RESELECT	RESELECT	
022.00	Off Site Trucking	1	Assumes off-site hauling NOT required (Assumes on-site placement of spoils)	0	CY	\$0.00	\$0	\$0	\$0	\$0	\$0	
023 Basement Walls		1	Poured-8"; bitum/damp; sill plates	3,171	BWA	\$5.37	\$16,992	\$16,992	\$0	\$16,992	\$0	
023.00	Partial Height Basement Wall Framing	1	Not Used	0	BWA	\$0.00	\$0	\$0	\$0	\$0	\$0	
023.10	Basement Wall Insulation	1	None	3,171	BWA	\$0.00	\$0	\$0	\$0	\$0	\$0	

Alternate Selections illustrating self documenting line item changes to component costs and Self-Correcting feature (Line 022 Basement Excavation) wherein "ERROR" was triggered when "Walkout Basement" was deselected in '40' Design Characteristics, requiring selection of Full Basement excavation options.

Figure 6

**Residential Cost Estimation  
Construction Summary  
"Component Options"**

- **Control Document** that provides outline construction descriptions of the building systems as selected by the Owner.
- **Serves a similar purpose as site and engineering drawings would provide** in that scope and construction requirements are called out for site, structural, mechanical, electrical and plumbing systems.
- Controls which material options are to be selected in cases where options exist in the guide spec sections.



**Guide Specifications  
CSI MASTERFORMAT  
Divisions 1-16**

- **Detailed Guide Specifications including all 16 CSI Divisions**
  - Division 1 - General Requirements
  - Division 2 - Site Construction
  - Division 3 - Concrete
  - Division 4 - Masonry
  - Division 5 - Metals
  - Division 6 - Wood And Plastics
  - Division 7 - Thermal And Moisture Protection
  - Division 8 - Doors And Windows
  - Division 9 - Finishes
  - Division 10 - Specialties
  - Division 11 - Equipment
  - Division 12 - Furnishings
  - Division 13 - Special Construction
  - Division 14 - Conveying Systems
  - Division 15 - Mechanical
  - Division 16 - Electrical

**Figure 7**